

What is claimed is:

1 1. A flat panel display device, comprising:
2 a first substrate;
3 an electron emission assembly being formed on said first substrate;
4 a second substrate being provided at a predetermined distance from said first substrate, said
5 first and second substrates forming a vacuum assembly; and
6 an illumination assembly being formed on said second substrate, said illumination
7 assembly being illuminated by electrons emitted from said electron emission assembly;
8 said illumination assembly comprising:
9 at least one anode electrode being formed on a first surface of said second substrate
10 to face said first substrate, the first surface of said second substrate facing said first
11 substrate;
12 a plurality of phosphor layers being formed in a predetermined pattern on said at
13 least one anode electrode; and
14 a plurality of conductive layers being formed on said phosphor layers, said plurality
15 of conductive layers being formed of a carbon-based material.

1 2. The flat panel display device of claim 1, with said plurality of conductive layers
2 being made of carbon nanotubes.

1 3. The flat panel display device of claim 2, with said carbon nanotubes having a length
2 not longer than 5 micrometers.

1 4. The flat panel display device of claim 1, with said plurality of conductive layers
2 being formed by electrophoresis.

1 5. The flat panel display device of claim 1, with said at least one anode electrode being
2 formed in a predetermined anode electrode pattern and corresponding to a plurality of anode
3 electrodes formed at a predetermined distance on said second substrate to form a striped pattern.

1 6. The flat panel display device of claim 5, further comprising:
2 a plurality of black matrix layers being formed between said plurality of anode electrodes,
3 said plurality of black matrix layers not contacting said plurality of anode electrodes.

1 7. The flat panel display device of claim 6, with said plurality of black matrix layers
2 being electrically conductive and contacting said plurality of conductive layers.

1 8. The flat panel display device of claim 5, further comprising:
2 a plurality of black matrix layers being formed between said plurality of anode electrodes,
3 said plurality of black matrix layers contacting said plurality of anode electrodes.

1 9. The flat panel display device of claim 8, with said plurality of black matrix layers
2 being electrically conductive and contacting said plurality of conductive layers.

1 10. The flat panel display device of claim 1, with said at least one anode electrode
2 including indium tin oxide.

1 11. The flat panel display device of claim 1, with said at least one anode electrode being
2 formed as a single unit covering over 80% of the first surface of said second substrate.

1 12. The flat panel display device of claim 1, said electron emission assembly
2 comprising:

3 a plurality of cathode electrodes being formed on a first surface of said first substrate to
4 face said second substrate, the first surface of said first substrate facing said second substrate;

5 at least one gate electrode being formed on the first surface of said first substrate to face
6 said second substrate;

7 an insulation layer separating said plurality of cathode electrodes from said at the least one
8 gate electrode; and

9 a plurality of electron emission sources being formed on said plurality of cathode electrodes
10 and being positioned within holes formed in said insulation layer and in said at least one gate
11 electrode.

1 13. The flat panel display device of claim 12, with said plurality of electron emission
2 sources including at least one carbon-based material selected from the group consisting of carbon
3 nanotubes, fullerenes, diamond-like carbon, graphite, and a mixture of these materials.

1 14. The flat panel display device of claim 1, said electron emission assembly
2 comprising:

3 a plurality of cathode electrodes being formed on a first surface of said first substrate to
4 face said second substrate, the first surface of said first substrate facing said second substrate;

5 at least one gate electrode being formed on the first surface of said first substrate to face
6 said second substrate;

7 an insulation layer separating said plurality of cathode electrodes from said at the least one
8 gate electrode; and

9 a plurality of electron emission sources being mounted on said plurality of cathode
10 electrodes.

1 15. The flat panel display device of claim 14, with said plurality of electron emission
2 sources including at least one carbon-based material selected from the group consisting of carbon
3 nanotubes, fullerenes, diamond-like carbon, graphite, and a mixture of these materials.

1 16. A method for manufacturing a flat panel display device, the method comprising:
2 forming anode electrodes on a substrate;

3 forming phosphor layers on the anode electrodes;
4 immersing the substrate in a solution including dispersed carbon-based material;
5 adhering the carbon-based material on a surface of the phosphor layers by electrophoresis;
6 cleaning the substrate; and
7 drying the substrate.

1 17. The method of claim 16, with the carbon-based material corresponding to carbon
2 nanotubes.

1 18. The method of claim 17, with the carbon nanotubes having a length not longer than
2 5 micrometers.

1 19. The method of claim 16, further comprising performing an ultrasonic process on
2 the solution.

1 20. The method of claim 16, with the flat panel display device corresponding to a field
2 emission display.